

§ 29.1199 Extinguishing agent containers.

(a) Each extinguishing agent container must have a pressure relief to prevent bursting of the container by excessive internal pressures.

(b) The discharge end of each discharge line from a pressure relief connection must be located so that discharge of the fire extinguishing agent would not damage the rotorcraft. The line must also be located or protected to prevent clogging caused by ice or other foreign matter.

(c) There must be a means for each fire extinguishing agent container to indicate that the container has discharged or that the charging pressure is below the established minimum necessary for proper functioning.

(d) The temperature of each container must be maintained, under intended operating conditions, to prevent the pressure in the container from—

(1) Falling below that necessary to provide an adequate rate of discharge; or

(2) Rising high enough to cause premature discharge.

(Secs. 313(a), 601, and 603, 72 Stat. 759, 775, 49 U.S.C. 1354(a), 1421, and 1423; sec. 6(c), 49 U.S.C. 1655 (c))

[Doc. No. 5084, 29 FR 16150, Dec. 3, 1964, as amended by Amdt. 29–13, 42 FR 15047, Mar. 17, 1977]

§ 29.1201 Fire extinguishing system materials.

(a) No materials in any fire extinguishing system may react chemically with any extinguishing agent so as to create a hazard.

(b) Each system component in an engine compartment must be fireproof.

§ 29.1203 Fire detector systems.

(a) For each turbine engine powered rotorcraft and Category A reciprocating engine powered rotorcraft, and for each Category B reciprocating engine powered rotorcraft with engines of more than 900 cubic inches displacement, there must be approved, quick-acting fire detectors in designated fire zones and in the combustor, turbine, and tailpipe sections of turbine installations (whether or not such sections are designated fire zones) in numbers

and locations ensuring prompt detection of fire in those zones.

(b) Each fire detector must be constructed and installed to withstand any vibration, inertia, and other loads to which it would be subjected in operation.

(c) No fire detector may be affected by any oil, water, other fluids, or fumes that might be present.

(d) There must be means to allow crewmembers to check, in flight, the functioning of each fire detector system electrical circuit.

(e) The wiring and other components of each fire detector system in an engine compartment must be at least fire resistant.

(f) No fire detector system component for any fire zone may pass through another fire zone, unless—

(1) It is protected against the possibility of false warnings resulting from fires in zones through which it passes; or

(2) The zones involved are simultaneously protected by the same detector and extinguishing systems.

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Subpart F—Equipment

GENERAL

§ 29.1301 Function and installation.

Each item of installed equipment must—

(a) Be of a kind and design appropriate to its intended function;

(b) Be labeled as to its identification, function, or operating limitations, or any applicable combination of these factors;

(c) Be installed according to limitations specified for that equipment; and

(d) Function properly when installed.

§ 29.1303 Flight and navigation instruments.

The following are required flight and navigational instruments:

(a) An airspeed indicator. For Category A rotorcraft with V_{NE} less than a speed at which unmistakable pilot cues provide overspeed warning, a maximum allowable airspeed indicator must be

provided. If maximum allowable air-speed varies with weight, altitude, temperature, or r.p.m., the indicator must show that variation.

(b) A sensitive altimeter.

(c) A magnetic direction indicator.

(d) A clock displaying hours, minutes, and seconds with a sweep-second pointer or digital presentation.

(e) A free-air temperature indicator.

(f) A non-tumbling gyroscopic bank and pitch indicator.

(g) A gyroscopic rate-of-turn indicator combined with an integral slip-skid indicator (turn-and-bank indicator) except that only a slip-skid indicator is required on rotorcraft with a third attitude instrument system that—

(1) Is usable through flight attitudes of ± 80 degrees of pitch and ± 120 degrees of roll;

(2) Is powered from a source independent of the electrical generating system;

(3) Continues reliable operation for a minimum of 30 minutes after total failure of the electrical generating system;

(4) Operates independently of any other attitude indicating system;

(5) Is operative without selection after total failure of the electrical generating system;

(6) Is located on the instrument panel in a position acceptable to the Administrator that will make it plainly visible to and useable by any pilot at his station; and

(7) Is appropriately lighted during all phases of operation.

(h) A gyroscopic direction indicator.

(i) A rate-of-climb (vertical speed) indicator.

(j) For Category A rotorcraft, a speed warning device when V_{NE} is less than the speed at which unmistakable overspeed warning is provided by other pilot cues. The speed warning device must give effective aural warning (differing distinctively from aural warnings used for other purposes) to the pilots whenever the indicated speed exceeds V_{NE} plus 3 knots and must operate satisfactorily throughout the ap-

proved range of altitudes and temperatures.

(Secs. 313(a), 601, 603, 604, and 605 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, 1424, and 1425); and sec. 6(c), Dept. of Transportation Act (49 U.S.C. 1655(c)))

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§ 29.1305 Powerplant instruments.

The following are required powerplant instruments:

(a) For each rotorcraft—

(1) A carburetor air temperature indicator for each reciprocating engine;

(2) A cylinder head temperature indicator for each air-cooled reciprocating engine, and a coolant temperature indicator for each liquid-cooled reciprocating engine;

(3) A fuel quantity indicator for each fuel tank;

(4) A low fuel warning device for each fuel tank which feeds an engine. This device must—

(i) Provide a warning to the crew when approximately 10 minutes of usable fuel remains in the tank; and

(ii) Be independent of the normal fuel quantity indicating system.

(5) A manifold pressure indicator, for each reciprocating engine of the altitude type;

(6) An oil pressure indicator for each pressure-lubricated gearbox.

(7) An oil pressure warning device for each pressure-lubricated gearbox to indicate when the oil pressure falls below a safe value;

(8) An oil quantity indicator for each oil tank and each rotor drive gearbox, if lubricant is self-contained;

(9) An oil temperature indicator for each engine;

(10) An oil temperature warning device to indicate unsafe oil temperatures in each main rotor drive gearbox, including gearboxes necessary for rotor phasing;

(11) A gas temperature indicator for each turbine engine;

(12) A gas producer rotor tachometer for each turbine engine;

(13) A tachometer for each engine that, if combined with the applicable instrument required by paragraph